



Naval Postgraduate School

Joint Task Force Katrina Relief Effort



Unclassified

Information Brief

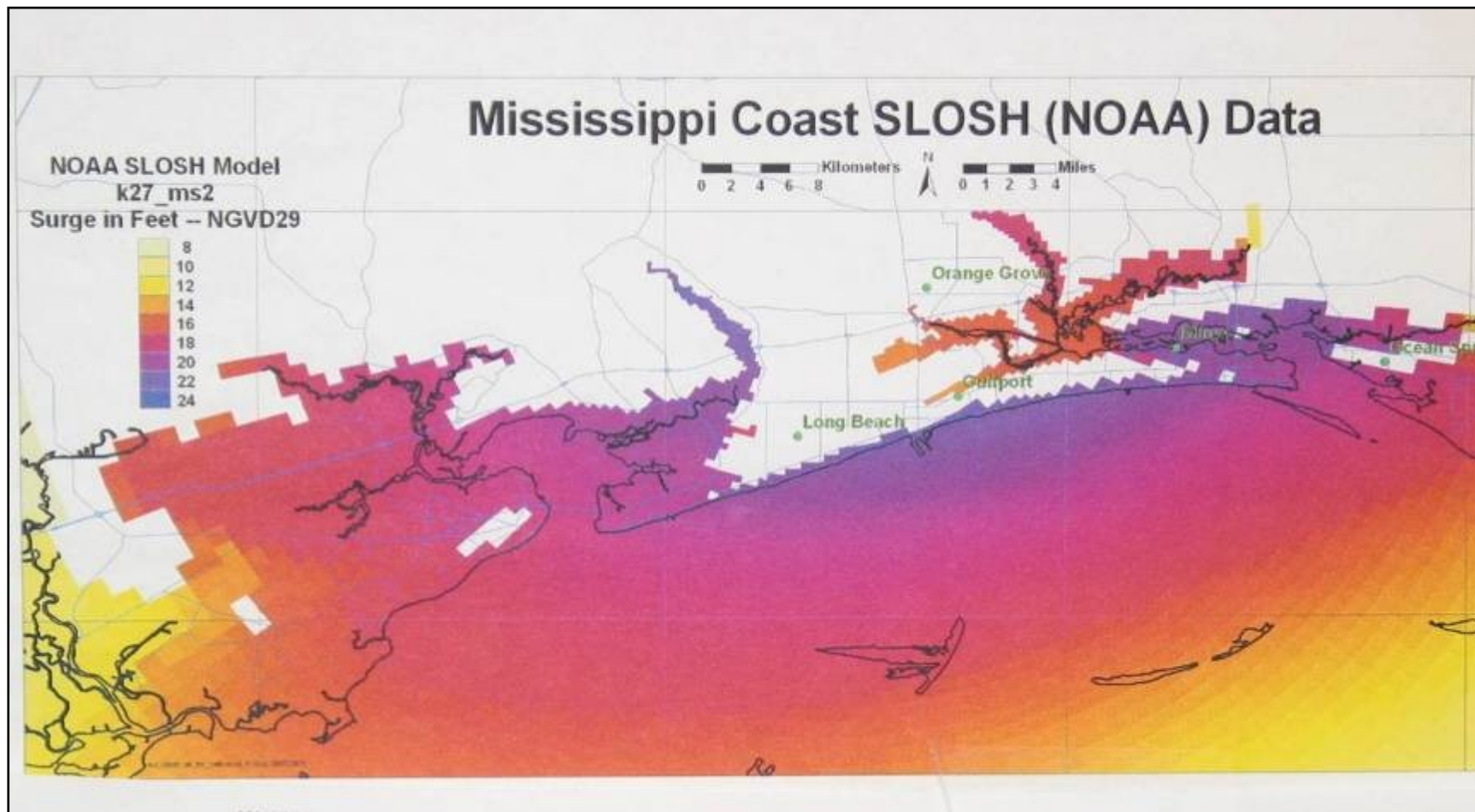


Purpose/Objective

- **Purpose:** To provide the Int'l Maritime Protection Symposium with a sketch of NPS's Hastily Formed Network deployed in support of the emergency response to Hurricane Katrina.
- **Objective:** To show relevance of the NPS Humanitarian Assistance/Disaster Relief work to the global humanitarian assistance community.



The Storm Surge.....





The Images.....





The Problem.....

- No power
- No fiber/copper infrastructure
- No push-to-talk comms to speak of
- Cellular services totally jammed
- Satellite phone service totally jammed
- Not enough satellite eqpt suites available
- No Internet access (web, email, VOIP)

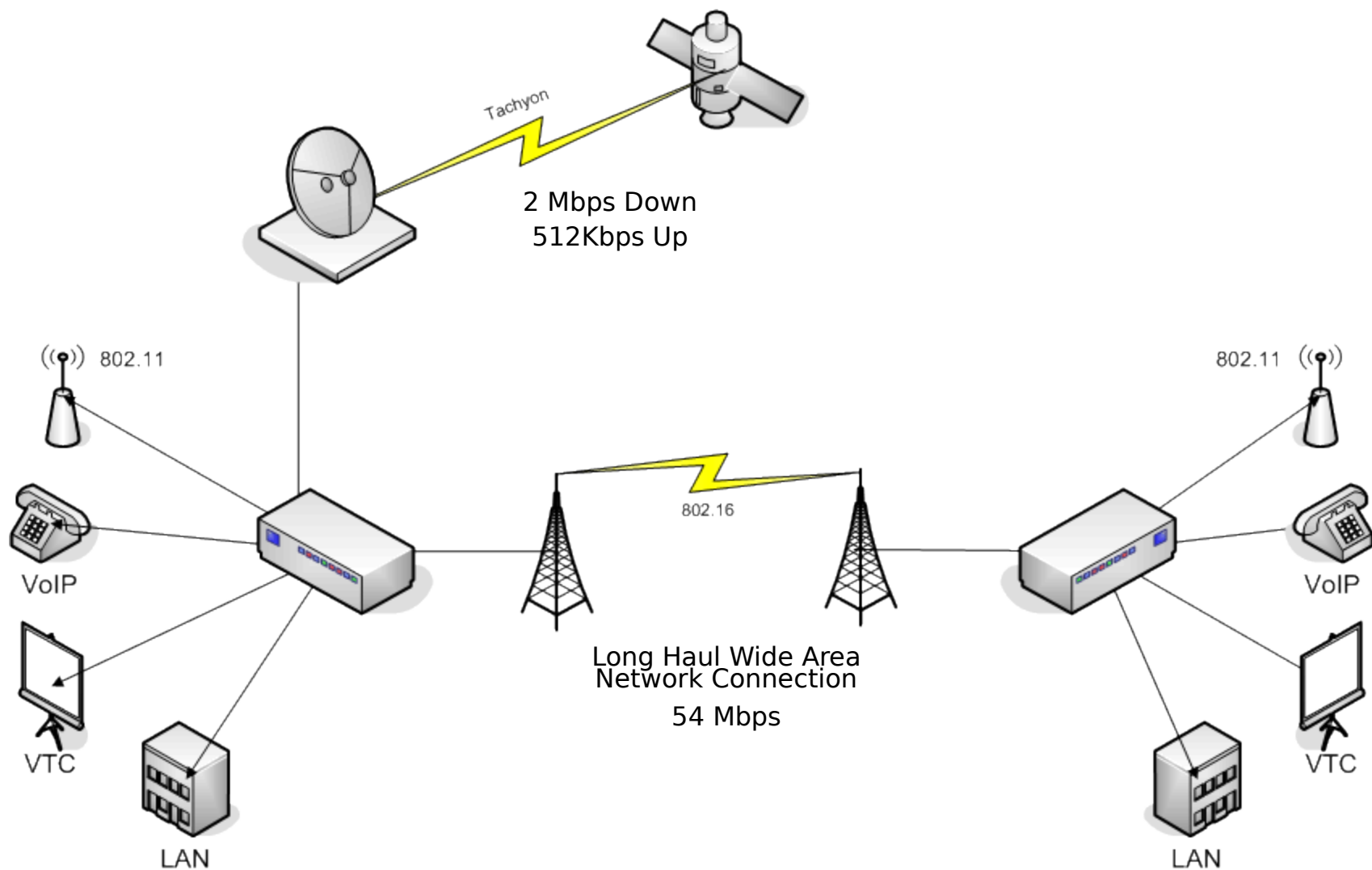


The Solution.....

- SATCOM Internet Reachback
- 802.11 (WiFi) and 802.16 (WiMax)
- Broadband Internet, Web, Email
- Voice Over IP (basic dial-tone)
- Skype (free internet phone)
- Groove (collaboration solution)



Employed Technologies





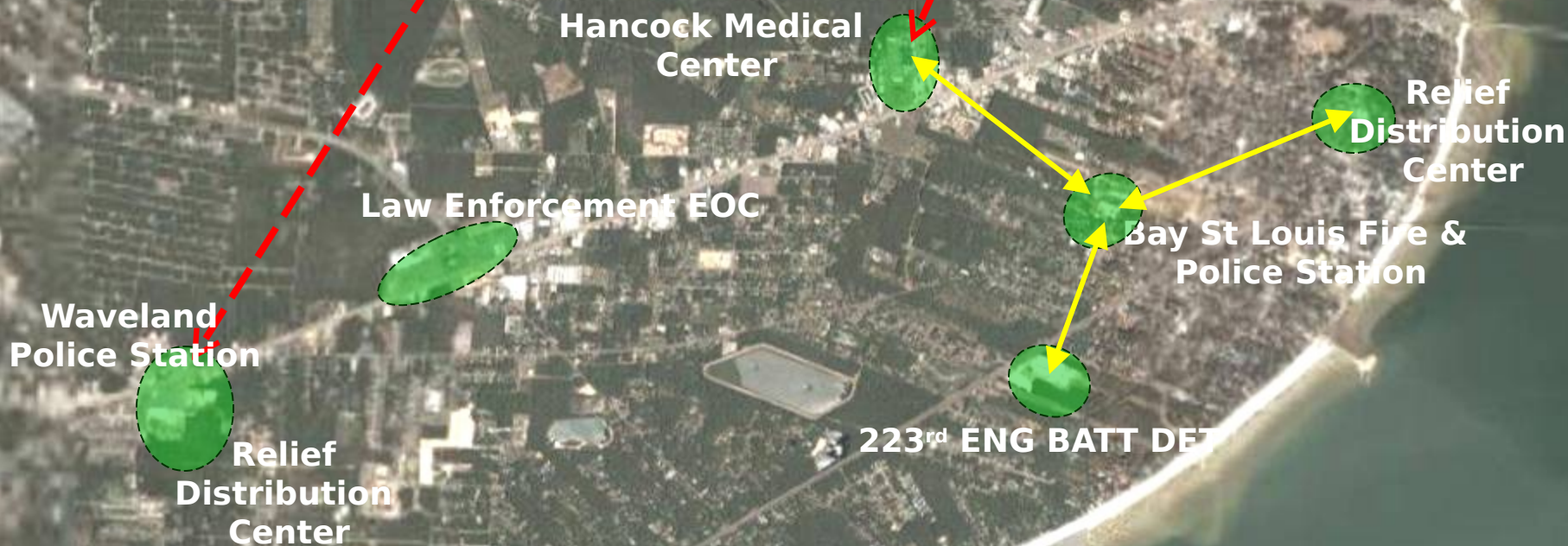
The Team.....

- **NPS Faculty Members (2)**
- **NPS Students (19)**
 - Information Warfare, Information Systems and Technology, Joint C4I Systems, Space Systems Operations, Space Systems Engineering
 - Multi-service, Multi-designator
- **Others:**
 - **Naval Reservists (5)**
 - Naval Security Group Reserve
 - **OSD NII Observer**
 - Active Duty Commander, USN
 - **Corporate Partners**
 - Cisco, Microsoft, Redline, Tachyon, Mercury Data Systems, Rajant Corp.

Areas of Operation



Network Infrastructure



NPS DET 1 NETWORK

Tachyon Satellite ← →

802.16 Wireless ↔

802.11 Wireless ○

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Accomplishments

- Created and extended full scale, timely, and self contained wide area network in an austere environment
- Expanded upon prior research
- Ran a more diverse and comprehensive set of applications than had been tested at NPS
- Valuable student real world application of technology



Detachment 2

- NPS Faculty Members (2)
 - Dr. Alex Bordetsky, Professor
 - Eugene Bourakov, Research
- NPS Students (2)
 - CDR John Looney, US Navy
 - Department of Information Sciences
 - PhD Student
 - CPT Maria Vedder, US Army
 - Department of Defense Analysis
 - Civil Affairs
- Area of Operations
 - Pascagoula, MS



USNS Comfort, Pascagoula City Dock

- Gulfport, MS



View from I-10 Bridge



Detachment 2

Areas of Operation





Employed Technologies

TNT Solution

1. OFDM System

- Used Orthogonal Frequency Division Multiplexing (**OFDM**)/802.16 wireless link to establish a long haul ship-to-shore communications link from PCU SAN ANTONIO (LPD 17) to the base HQ at Naval Station Pascagoula.

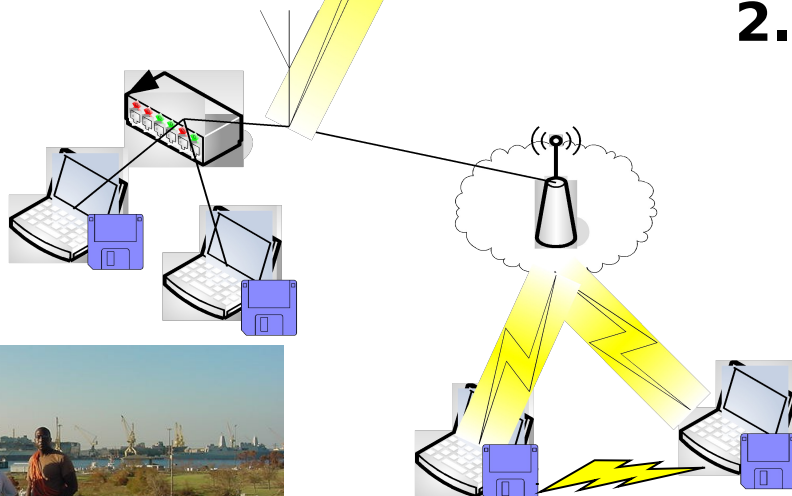
2. Wireless Mesh

- Extended the network beyond a single point by utilizing the **wireless mesh** capability. Total wireless network extends for approximately 4 kilometers above the water



Long Haul Wireless
Network Connection

54 Mbps





Accomplishments

- Low cost, Low Burden, High Payoff
- Proof of Concept
- Adaptable for employment in austere environments
- Evolving collaborative network





Lessons Learned

- NPS:
 - Truly a Proof of Concept
 - Practical value for students and faculty
 - Enhanced research opportunities and theses insights
 - HFN very hot topic domestically and internationally
- Navy:
 - Network Capability is a first responder necessity
 - Time Matters
 - Adaptability in austere environments
 - Applicability of wireless to disaster relief (ship/shore comms)
- Joint:
 - Collaborative environment using Internet technologies
 - Comms interoperability one of biggest HA/DR issues
 - Social/Political/Economic (soft science) as challenging as technical



Conclusion and Challenge.....

- “We” must do better
- Who are “We” ?
- How do “We” proceed ?
- Are we ready for the next international disaster, California’s “big one”, Global Avian Flu Pandemic, etc ?
- Need scalable, robust, interoperable comms !!
- Int’l Community, US DoD and DoN have a role !!

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